and the lower Mississippi River and its tributaries, but there were no floods except along the upper Yazoo watershed which was visited by a flood that for duration and height, considering the season of the year, was really remarkable. It was due to excessive rains over the headwaters of the Yazoo River from November 17 to 21, inclusive, supplemented by other heavy rains over northern Mississippi during the month of December. In the vicinity of Swanlake, Tallahatchie County, the river was above the flood stage of 24 feet from November 25 until after the close of the year. The maximum stage of 29.3 feet, which was the highest on record, was reached on December 2. Several thousand acres of cultivated lands in Tallahatchie and Leflore counties were under water from two to four weeks, and much unpicked cotton rotted in the fields. Some stock was lost in Quitman County, and the streets of several towns in adjoining counties were covered with water for several days.

Warnings were issued on the 16th for a moderate flood stage in the lower Wabash River, and on the 21st for moderately high stages in the lower Ohio. These warnings were verified within a small fraction of a foot, and resulted in the saving of corn, logs, and musselshells valued at thousands of dollars.

There was also a local flood in the Middle Trinity River of Texas from the 22d to the 28th, inclusive, due to excessive rainfall on the 15th and 16th. The flood was limited to the vicinity of Long Lake, Tex., and attention to the warnings issued prevented any damage. The highest stage reached at Long Lake was 40.4 feet, 5.4 feet above the flood stage.

Heavy rains over the valley caused two decided rises in the Sacramento River during the month, but flood stages were not reached except at Colusa, Cal., where the flood stage of 25 feet was exceeded by 0.2 foot on the 28.

The Missouri River closed at Pierre, S. Dak., on the 13th, but at the end of the month it was still practically open at Sioux City, Iowa. The Mississippi closed at Leclaire, Iowa, on the 21st, but was still open at Davenport, Iowa, at the end of the month. On both rivers conditions were quite similar to those of December, 1905. Floating ice first appeared at St. Louis, Mo., on the 20th, and on the following day navigation between St. Louis, Mo., and Cairo, Ill., was suspended. Ice appeared in the Mississippi River at Cairo on the 24th, but none was reported south of that place. Tne larger eastern rivers, except those of New England, remained open.

The highest and lowest water, mean stage, and monthly range at 289 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure for December, 1906, over the United States and Canada is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and V.

During December, 1906, the distribution of mean pressure showed several marked variations from the normal. The ridge of high mean pressure that usually extends from the south Atlantic coast northwesterly to the middle and northern Plateau districts, with the crest, about 30.20 inches, over southern Idaho, was largely replaced in the region west of the Mississippi Valley by comparatively low pressure. The ridge of highest mean pressure for the month extended from the South Atlantic and east Gulf States northwesterly over the Lake region, upper Mississippi Valley, North Dakota, and into the Canadian provinces of Manitoba and western Ontario, with the crest apparently north of the field of observation. The unusual persistence and strength of the great anticyclonic area that prevailed in the region north of the Great Lakes was conducive to the projection southward of numerous areas of high pressure which, spreading over the Dakotas, upper Mississippi Valley, Lake region, and thence eastward, gave to those districts rapid and severe changes in weather conditions.

Areas of high pressure were markedly absent from the districts west of the Rocky Mountains and over the middle and southern slope regions. The average pressure during the month exceeded the normal over nearly all parts of the United States and Canada, and was decidedly above the average along the northern border and in the Canadian districts from Manitoba to the St. Lawrence River and northward toward Hudson Bay, where the monthly averages exceeded the normal from 0.20 to 0.25 inch.

A slight deficiency in pressure, less than .05 inch, was general over the middle Plateau and central Pacific districts.

An unusual number of low pressure areas developed on the Pacific coast, that of the 10th being especially severe over the entire coast, with unusually high winds in the vicinity of San Francisco. In the presence of the extensive area of high pressure along the northern boundary, the paths of the lows eastward from the Rocky Mountain region were generally south of their normal tracks.

TEMPERATURE.

The temperature during December, 1906, averaged below the normal along the entire northern border from the Rocky Mountains eastward to the Atlantic. Over eastern Montana, North Dakota, northwestern Minnesota, and the greater part of New England the temperature during the first two decades of the month was unusually low, due to the rapid succession of areas of high pressure over those districts. The temperature was also below normal over the Florida Peninsula, especially in the central and southern districts, where phenomenally cold weather prevailed from the 23d to 27th, with frost and freezing weather nearly to the southern limit of the State.

A slight deficiency existed in the Sacramento Valley of California, due probably to the effect of air drainage from the surrounding mountains which were heavily covered with snow.

From the lower Mississippi Valley westward, over Texas, the middle and southern Rocky Mountain districts, and the whole of the Plateau region the month was unusually warm, the average excess ranging from 4° to 8° daily above the normal. No severe cold waves occurred over this extensive region and the temperature, with but few short exceptions, was continuously above the average.

Maximum temperatures of 80°, or higher, were confined to a small area of southern Texas and portions of southwestern Arizona and southern California. Over the northern portions of North Dakota, Minnesota, Wisconsin, and Michigan the maximum temperature did not reach 40°.

Minimum temperatures from 20° to 40° below zero were recorded in North Dakota and northern Minnesota on the 10th, and again on the 17th, and from 20° to 30° below zero over northern New England on the 12th and 19th.

Aside from the above-mentioned districts, minimum temperatures were not unusually low in any part of the United States except over central and southern Florida.

PRECIPITATION.

The precipitation was less than average over the South

Atlantic and Gulf States, central Texas, Oklahoma, Kansas, eastern Colorado, the middle Plateau district, and over the western portions of Washington and Oregon. Along the south Atlantic coast, over Florida, and the southern portions of the Gulf States the precipitation was very light. The amount of fall over the Florida Peninsula was less than 15 per cent of the normal, and the lack of moisture, especially in the central and northern counties of the State, as already noted in October and November, continued to the end of the year.

Over the districts near the coasts of Washington and Oregon the precipitation was from 2 to 4 inches less than the normal. Slight deficiences also occurred in the upper Mississippi Valley, near Lake Michigan, and generally over New York.

Precipitation was above the normal over the lower Ohio and middle Mississippi valleys, where marked excesses occurred in November. Amounts in excess of the average occurred over north-central and western Texas and over the entire upper Missouri Valley, the northern slope and Plateau districts, California, and the greater part of Arizona and New Mexico. Over practically all of California the month was an unusually wet one, the amounts in numerous cases exceeding the average by more than 10 inches.

Over northern and central Arizona the precipitation was unusually heavy, the amounts recorded at several points exceeding any previous December record.

SNOWFALL.

Measureable amounts of snowfall were recorded in all portions of the United States, except in a narrow strip along the south Atlantic and Gulf coasts, in southwestern Arizona and along the coast and on the lower elevations of California. The monthly amounts were generally above the normal over the upper Missouri Valley and over the entire Plateau region from northern Arizona to the northern boundary, including the western slopes of the Rocky Mountains and the higher elevations of the Sierras.

Snow was generally heavy over New England, the average fall ranging from one to three feet in the more northern portions. Heavy snow was also general over the mountain regions of northern and central California and extended unusually far down the slopes.

Over the eastern slopes of the Rocky Mountains from Wyoming south, and thence eastward to the Atlantic coast, the snowfall was generally less than the average and but little snow remained on the ground at any time during the month.

At the end of the month only the northern portions of New England and New York, the upper Lake region, upper Mississippi and Missouri valleys, and the high elevations of the western mountain and Plateau regions were snow covered. In northern New England depths from 10 to 26 inches prevailed, while over the eastern part of Montana, North Dakota, and the northern portions of Minnesota, Wisconsin, and Michigan depths from 5 to 30 inches remained on the ground.

Considerable snow had also accumulated on the western slopes of the Rocky Mountain districts and in the mountains of California.

HUMIDITY AND CLOUDINESS.

Cloudy weather and high humidity were general in all districts, except in the South Atlantic and Gulf States, where there was considerable sunshine and the moisture in the atmosphere was somewhat less than normal.

In Canada.—Prof. R. F. Stupart says :

The temperature was just average in the extreme southwestern portion of Ontario, also in Prince Edward Island and very locally in New Brunswick; elsewhere it was everywhere below the average and generally to a marked extent. The most noticeable negative departures were: Saskatchewan and Alberta, from 4° to 8°; Manitoba, 3°; the greater portion of Ontario, from 3° to 6°, and Quebec, from 2° to 5°.

The precipitation was above the average in Manitoba, also in nearly all portions of the Maritime Provinces, whilst in the other provinces it was in excess of the average in some localities and deficient in others. A few of the noticeable features of its distribution were the large positive departures over Nova Scotia and Cape Breton, the excessive snowfalls in Cariboo and more locally in northern Saskatchewan, and the marked negative departures again occurring in Ontario north and east of Lake Ontario to the boundary. The deficiency was well marked over a large portion of British Columbia.

At the close of the month snow was general over most of British Columbia; even at New Westminster 5 inches lay on the ground. In the Western Provinces a deep covering was the rule, northern Alberta recording 21 inches, Saskatchewan from 12 to 24 inches, and Manitoba from 7 to 12 inches. In Ontario, owing to the mild weather prevailing during the last week of the month, very little snow was left on the ground at the close of the year, except in northern localities; this was also the case in many portions of the Maritime Provinces, whilst in Quebec the depth was from 14 to 21 inches.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	9	25.7	— 4.1	+ 3.1	+ 0.3
Middle Atlantic	13	35.2	— 0.5	+12.6	+ 1.0
South Atlantic	10	48.4	+ 0.5	+ 5.7	+ 0.5
Florida Peninsula*	8	61.0	+ 0.1	+ 2.1	+ 0.2
East Gulf	8	52.7	+ 3.0	— 0.6	0.0
West Gulf	7	53.3	+ 3.6	+ 0.1	0.0
Ohio Valley and Tennessee	12	38.4	+ 0.7	+ 5.5	+ 0.5
Lower Lake	8	27.0	— 1.5	+12.5	+ 1.0
Upper Lake	10	24.1	— 0.5	+21.6	+ 1.8
North Dakota*	8	8.7	— 2.9	+22.1	+ 1.8
Upper Mississippi Valley	13	28.8	+ 1.2	+ 9.6	+ 0.8
Missouri Valley	11	29.8	+ 0.9	+11.2	+ 0.9
Northern Slope	7	26.8	+ 2.0	+11.1	+ 0.9
Middle Slope	6	38.8	+ 3.9	+ 2.0	+ 0.2
Southern Slope*	6	45.6	+ 4.6	—13.1	— 1.1
Southern Plateau*	13	43.5	+ 2.9	+ 1.8	+ 0.2
Middle Plateau*	8	30.7	+ 5.5	+ 2.5	+ 0.2
Northern Plateau*	12	33.3	+ 3.0	+20.6	+ 1.7
North Pacific	7	42.6	+ 0.7	+14.4	+ 1.2
Middle Pacific	5	48.3	— 0.3	+11.8	+ 1.0
South Pacific	4	53.5	+ 0.8	+ 9.0	+ 0.8

* Regular Weather Bureau and selected cooperative stations.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	9	3.89	115	+0.5	—1.8
Middle Atlantic	13	3.06	94	—0.2	+0.2
South Atlantic	10	2.50	75	—0.9	—4.6
Florida Peninsula*	8	0.58	22	—2.1	+2.4
East Gulf	8	3.77	84	—0.7	—0.2
West Gulf	7	2.63	90	—0.3	—8.3
Ohio Valley and Tennessee	12	4.20	114	+0.5	—3.0
Lower Lake	8	3.26	114	+0.4	—2.4
Upper Lake	10	2.20	96	—0.1	—1.7
North Dakota*	8	1.03	194	+0.5	+2.6
Upper Mississippi Valley	13	2.01	105	+0.1	—0.3
Missouri Valley	11	1.01	100	0.0	+1.3
Northern Slope	7	1.33	182	+0.6	+3.7
Middle Slope	6	0.37	43	—0.5	+2.1
Southern Slope*	6	0.64	51	—0.6	+4.2
Southern Plateau*	13	2.57	265	+1.6	+5.2
Middle Plateau*	8	1.34	129	+0.3	+4.7
Northern Plateau*	12	2.59	145	+0.3	+0.5
North Pacific	7	7.03	83	—1.4	—6.7
Middle Pacific	5	6.59	138	+1.8	+2.6
South Pacific	4	4.36	142	+1.3	+6.6

* Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	77	+ 1	Missouri Valley	79	+ 4
Middle Atlantic	76	+ 1	Northern Slope	78	+ 9
South Atlantic	76	— 2	Middle Slope	70	+ 4
Florida Peninsula	78	— 4	Southern Slope	75	+10
East Gulf	78	+ 1	Southern Plateau	67	+19
West Gulf	79	+ 5	Middle Plateau	77	+ 6
Ohio Valley and Tennessee	80	+ 4	Northern Plateau	82	+ 5
Lower Lake	82	+ 4	North Pacific	87	+ 1
Upper Lake	82	0	Middle Pacific	84	+ 3
North Dakota	84	+ 7	South Pacific	76	+ 7
Upper Mississippi Valley	84	+ 6			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Block Island, R. I.	1	57	nw.	New York, N. Y.	26	54	nw.
Do	2	60	nw.	North Head, Wash.	4	53	se.
Do	3	56	nw.	Do	6	88	se.
Do	4	56	nw.	Do	7	52	w.
Do	7	62	nw.	Do	10	94	se.
Do	8	61	nw.	Do	18	52	se.
Buffalo, N. Y	2	51	sw.	Do	22	56	se.
Do	6	76	sw.	Pittsburg, Pa.	6	52	w.
Canton, N. Y.	6	70	sw.	Point Reyes Light, Cal	10	92	s.
Cape Henry, Va	3	56	nw.	Do	25	80	sw.
Cleveland, Ohio	6	59	w.	Do	31	82	nw.
Do	7	54	nw.	Sacramento, Cal.	10	52	se.
Columbus, Ohio	6	58	w.	San Francisco, Cal.	10	53	sw.
Duluth, Minn.	13	50	ne.	Seattle, Wash.	6	60	sw.
Mount Tamalpais, Cal.	1	52	ne.	Do	10	63	s.
Do	10	69	se.	Do	11	57	s.
Do	30	51	nw.	Southeast Farallon, Cal.	10	76	s.
Mount Weather, Va.	1	56	nw.	Do	25	62	s.
Do	3	62	nw.	Do	31	64	nw.
Do	7	56	nw.	Tatoosh Island, Wash.	6	72	s.
Do	23	52	nw.	Do	7	86	sw.
Do	24	50	nw.	Do	10	70	e.
Do	25	73	nw.	Do	11	72	sw.
Do	26	66	nw.	Do	21	50	e.
New York, N. Y.	1	54	w.	Do	25	54	e.
Do	2	51	nw.	Do	26	58	e.
Do	7	58	w.	Toledo, Ohio	6	57	w.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	7.4	+ 1.6	Missouri Valley	6.8	+ 1.7
Middle Atlantic	7.1	+ 1.7	Northern Slope	6.4	+ 1.8
South Atlantic	5.3	+ 0.6	Middle Slope	4.7	+ 0.7
Florida Peninsula	3.5	— 1.1	Southern Slope	4.6	+ 0.2
East Gulf	5.8	+ 0.6	Southern Plateau	4.3	+ 1.3
West Gulf	6.0	+ 0.7	Middle Plateau	6.1	+ 1.0
Ohio Valley and Tennessee	7.8	+ 1.7	Northern Plateau	8.4	+ 1.3
Lower Lake	8.7	+ 1.1	North Pacific	8.2	+ 0.9
Upper Lake	7.8	+ 0.7	Middle Pacific	6.7	+ 1.3
North Dakota	6.6	+ 1.4	South Pacific	5.8	+ 1.4
Upper Mississippi Valley	7.4	+ 1.7			